

Motile *Aeromonas* and *Pseudomonas* Septicemia

I. Causative Agent and Disease

Motile bacterial septicemias are caused by Gram-negative bacteria including *Aeromonas* and *Pseudomonas* with the *Aeromonas hydrophila*-complex and *Pseudomonas fluorescens* being the most common species. The *A. hydrophila* (*liquefaciens*) complex contains numerous biotypes and serotypes of *A. hydrophila* as well as *A. sobria*, *A. caviae*, *A. shuberti* and *A. veronii*. These bacteria are ubiquitous in the aquatic environment and are found around the world in both fresh and brackish water, but more commonly in freshwater. These bacteria generally cause a systemic, hemorrhagic disease in fish. Most of these bacteria are considered opportunistic pathogens causing disease in fish compromised by stress or other pathogens. Some species, most commonly *P. fluorescens* and *A. hydrophila*, have been reported as primary fish pathogens in systems of high intensity fish culture.

II. Host Species

When less than optimum conditions prevail, all freshwater fish species are likely susceptible to these bacteria. Among salmonids, rainbow trout and Chinook salmon are probably the most susceptible to the *A. hydrophila* complex. Both *Aeromonas* and *Pseudomonas* are pathogenic for other cold-blooded vertebrates including frogs and reptiles and will infect mammals including man through wounds or when they are immunocompromised.

III. Clinical Signs

Lethargy, low-level mortality and occasional cutaneous lesions on the body surface may occur. Inflammation and erosion in and around the mouth with

hemorrhaging and necrosis of the fins is common. Exophthalmia and abdominal distention with ascitic fluid may also be present. Internally, the kidney may be soft and swollen and the spleen enlarged. Petechial hemorrhages may be present internally in many tissues and the intestines may be inflamed and filled with yellow mucus or bloody fluid.

IV. Transmission

These bacteria are among the normal flora of healthy fish and are ubiquitous in the aquatic environment. They are particularly abundant in organically polluted waters while infected carrier fish and other aquatic animals can serve as reservoirs. Transmission is horizontal from fish to fish or from contaminated water. Water temperatures 10°C or above favor these opportunistic pathogens.

V. Diagnosis

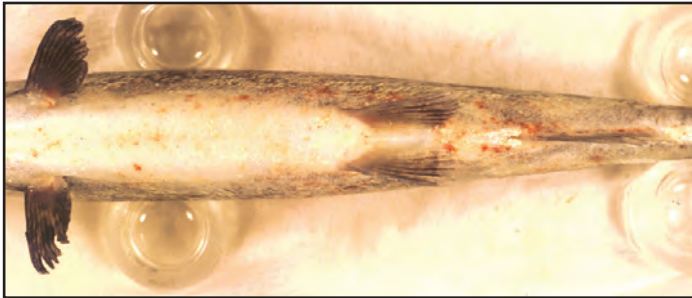
A presumptive diagnosis is made when fish exhibit characteristic clinical signs with tissue imprints, squashes or blood smears containing Gram-negative, motile rod-shaped bacteria. A definitive diagnosis is made by isolation of the organism on appropriate bacteriological media followed by identification from biochemical tests.

VI. Prognosis for Host

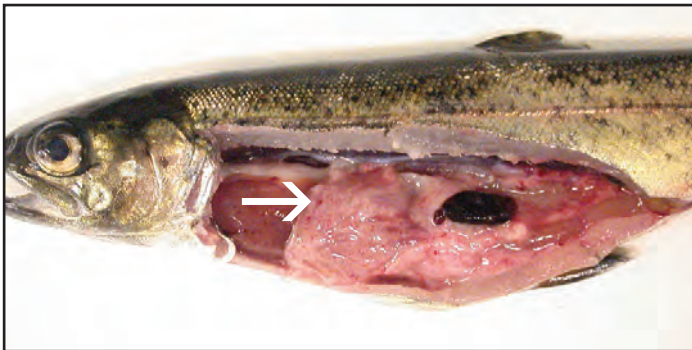
Severely affected fish will die. However, these bacteria are generally weak pathogens. Poor environmental conditions predispose fish to disease outbreaks which are self-resolving without intervention by antibiotic therapy when the source of stress is removed. When necessary, antibiotic therapy can be effective, except some pseudomonads are resistant to available aquaculture drugs.

VII. Human Health Significance

Some bacteria in these genera can cause disease in humans through wounds or when immunocompromised.



Petechial hemorrhages on ventral surface of a salmonid fish with bacterial septicemia.



Petechial hemorrhages of liver, pyloric caeca, gut and visceral fat (arrow) of a juvenile salmonid fish with bacterial septicemia.